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Neutron Activation Analysis of Children's Hair from Altai Republic

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The study focuses on the chemical composition of human hair as an indicator of the level of income of the chemical elements in the human body and its impact on growth and development of children and teenages in the local geochemical conditions. Neutron activation analysis (NAA) was used to analyze 186 samples of hair of children from four villages of Altai Republic. Data for 54 boys and 132 girls in the age of 7 to 17 were analyzed. Significantly higher content of sodium, aluminum and chlorine was observed in the hair of boys over girls. The following short-lived isotopes were determined: Na, Mg, Al, S, Cl, K, Ca, V, Mn, Cu and I. Concentrations of magnesium and calcium were significantly higher in the hair of girls. Iodine, copper, manganese and sulfur concentrations in the hair of boys and girls are close to each other, the differences between the sexes are not significant. Median concentrations of the studied elements in the hair of boys and girls were, respectively: Na –75 и50; Mg –49 и62; Al –21 и13; S –41150 и39850; Cl –1020 и390; Ca –608 и973; Mn –1,1 и0,82; Cu –9; I –0,2 mg/g. It was shown that the high content of calcium and magnesium is observed in the hair of children living in rural areas with high hardness and salinity of drinking water. Iodine concentrations in the hair of studied cohort of children is low, especially in puberty.

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